

**MPD 1860.1  
REVISION G**

**EFFECTIVE DATE: October 28, 2004  
EXPIRATION DATE: October 28, 2009**

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# **MARSHALL POLICY DIRECTIVE**

**AD01**

## **LASER SAFETY**

**CHECK THE MASTER LIST at  
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## DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Canceled)	Document Revision	Effective Date	Description
Revision	E	11/30/99	Document rewritten from MMI 1860.3 to an MPD.
Revision	F	7/02/01	Section 1, changed “procedures” to “policy”; added last sentence to section 2; changed section 3 to 29 CFR 1926.54; deleted 4.c. and 4.d; added 6.b, 6.d, 6.g, and 6.h; changed 6.e. to read “directly or from specular reflection. Upper limit for a continuous wave for a class 3a is .005 watts and typically .5 watts for a class 3b.”; changed “laser devices” to “lasers or laser systems” in 8.a(1) and 8.a(2); added “or laser systems” to 8.a(3) and deleted the last sentence; deleted 8.a(6) and added 8.a(7); changed “laser devices” to “lasers or laser systems” in 8.c(1) and 8.c(3); changed 8.c(4) to read “for Class 3b and 4 lasers or laser systems and alignment procedures for classes 2, 3a, 3b and 4 and submit”; added 8.c(11) and 8.c(12); changed section 9 to read “The following records are maintained by Environmental Health services and dispositioned no earlier than 3 years; and deleted all quality records except MSFC Form 3543, and added Certificates of Training.
Revision	G	10/28/2004	Changed font type throughout document to Times New Roman. Changed throughout document the words will to shall. Section 6(f), added (>0.5 watt). Section 8(c)(9), added statement, Personnel shall submit an updated MSFC Form 3543 when changes are made. Section 8 (a) (2), added the words ‘based on information provided’. Section 8 (a) (3), added the words ‘that are provided’. Deleted Section 8 (c) (10), Provide to OMEHS, by April 15 <sup>th</sup> of each year, an updated MSFC Form 3543 for each classes of 3b or 4 lasers or laser system. Renumbered the section from there.

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## 1. PURPOSE

The purpose of this Directive is to provide policy for personnel protection from hazards caused by laser operations.

## 2. APPLICABILITY

This Directive is applicable to all MSFC personnel and contractors. This Directive does not apply to bar code readers, laser printers, laser optical disc readers (CD ROMS), or any other system with a laser device which is enclosed as an integral part of the system. These are categorized as Class 1 or Exempt (see definition). Laser pointers, Class 3A or less, are also exempt from this Directive, but safe practices shall be exercised when using these devices.

## 3. AUTHORITY

29 CFR 1926.54, "Non-Ionizing Radiation"

## 4. APPLICABLE DOCUMENTS

- a. MWI 5100.1, "Initiating Procurement Requisitions"
- b. ANSI Z136.1, "American Standard for Safe Use of Lasers"

## 5. REFERENCES

- a. MPR 5000.1 "Purchasing"
- b. MWI 5100.1 "Initiating Purchase Requisitions"
- c. MWI 5113.1, "Government-wide Commercial Purchase Card Operating Procedures"

## 6. DEFINITIONS

- a. Accessible Emission Limit (AEL). The maximum accessible emission level permitted with a particular class.
- b. Aversion Response. Closure of eyelid or movement of head to avoid an exposure.
- c. Class 1 or Exempt. Any laser or laser system that cannot emit accessible laser radiation levels in excess of the Class 1 AEL for the maximum possible duration inherent in the design or intended use of the laser or laser system during normal operation. Thus, these lasers or laser systems are exempt from all control measures or other form of surveillance with the exception of applicable requirements for embedded lasers. The exemption strictly applies to emitted laser radiation hazards and not to other potential hazards.

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d. Class 2. Any laser or laser system considered low power (producing less than 1 milliwatt) and are in the visible spectrum (400-700 nm). Eye protection comes from aversion response.

e. Class 3a/3b. Any laser or laser system that can harm the eye if viewed directly or from specular reflection. Upper limit for a continuous wave Class 3a is .005 watts and typically .5 watts for a Class 3b.

f. Class 4 (producing greater than 0.5 watt). Any laser or laser system that can produce an eye hazard not only from direct or specular reflections but also from a diffuse reflection. In addition, such lasers may produce fire and skin hazards.

g. Diffuse Reflection. Change of the spatial distribution of a beam of radiation when it is reflected in many directions by a surface or by a medium.

h. Specular Reflection. A mirror-like reflection.

## 7. POLICY

It is the policy of MSFC to have a continuing and aggressive program for the control of hazards from lasers.

## 8. RESPONSIBILITIES

a. Occupational Medicine and Environmental Health Services (OMEHS), Integrated Customer Support Department, shall:

- (1) Survey, evaluate, and recommend actions needed to control hazards associated with operations involving the use of lasers or laser systems.
- (2) Maintain a current inventory, based on information provided, of all Classes 3b and 4 lasers or laser systems at MSFC.
- (3) Review plans, specifications, and operating procedures that are provided, for all operations using Classes 3b or 4 lasers or laser systems and approve or disapprove requests for deviations from established requirements.
- (4) Review and approve/disapprove all purchase requests for Classes 3b and 4 lasers or laser systems.
- (5) Maintain a current roster of all personnel who use or provide maintenance on Classes 3b and 4 lasers or laser systems and assure they receive appropriate medical examinations, including a baseline ophthalmological eye examination, as required.
- (6) Work closely with the Safety & Mission Assurance (S&MA) Directorate on interrelated

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problems involving both the health and safety of personnel working with lasers.

(7) Provide annual laser safety training, including refresher training for all Classes 3b and 4 lasers or laser system users.

b. Offices of Chief Financial Officer and Procurement shall review procurement requests for lasers or laser systems to ensure that special approval, as required by MWI 5100.1, has been obtained.

c. Director/Managers/Team Leads of each Organization shall:

(1) Prepare and submit to OMEHS a laser registration form, MSFC Form 3543, for all new lasers or laser systems received at MSFC.

(2) Comply with the American National Standard for the Safe Use of Lasers, ANSI Z136.1, for all laser operations at MSFC.

(3) Notify OMEHS in advance of new operations which will use Classes 3b or 4 lasers or laser systems so that an evaluation can be performed.

(4) Prepare written operating and alignment procedures for Classes 3b and 4 lasers or laser optical systems and submit them to OMEHS for approval and signature.

(5) Ensure that all standards, guidelines, and procedures relating to the protection of personnel from laser radiation hazards are complied with and all users are trained in the proper use of the laser or laser system.

(6) Ensure all laser areas are equipped with adequate safety devices and are properly posted with appropriate warning signs in accordance with MWI 8715.3 and ANSI Z136.1.

(7) Maintain a list of all personnel authorized to use lasers or laser systems.

(8) Ensure that all personnel listed on MSFC Form 3543 as users of lasers or laser systems report for health monitoring examinations as required by OMEHS.

(9) Notify OMEHS each time a Classes 3b or 4 laser operation changes location or property custodians, is turned in, or is disposed of in any manner. Personnel shall submit an updated MSFC Form 3543 when changes are made.

(10) Ensure all users of Classes 3b or 4 lasers or laser systems are trained in the safe use of lasers and receive annual laser safety refresher training.

(11) Ensure appropriate personal protective equipment is provided and all users of Classes 3b or 4 lasers or laser systems are trained in the correct use of it.

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d. Safety and Mission Assurance Directorate: shall forward all problems or concerns with lasers identified during inspections/audits or expressed by MSFC employees to OMEHS for resolution and/or correction.

## 9. RECORDS

a. The following records shall be maintained by OMEHS for 3 years and then maintained for historical purposes or destroyed.

- (1) MSFC Form 3543, "Laser Registration Form"
- (2) Training Rosters
- (3) Inventory for Classes 3b and 4 lasers or laser systems
- (4) Current roster of users

b. The following records shall be maintained/dispositioned by the user organization: Alignment and operating procedures.

c. Purchase requisitions generated in IFMP system shall be maintained by the responsible contracting officer in the Office of Procurement in accordance with MPR 5000.1 "Purchasing."

d. Credit card purchase records shall be maintained and dispositioned by the cardholder in accordance with MWI 5113.1, "Government-wide Commercial Purchase Card Operating Procedures."

## 10. MEASUREMENT

None

## 11. CANCELLATION

MPD 1860.1F dated July 2, 2001

Original signed by  
Robin N. Henderson for

David A. King  
Director